

II. SMOG CHECK PROGRAM DESIGN

Currently, the frequency and type of Smog Check inspection varies throughout the State. There are three basic levels of I/M programs. In Change of Ownership areas, vehicle owners are required to obtain a two-speed idle test before transferring vehicle ownership; in Basic areas, vehicle owners must obtain a two-speed idle test every two years and upon change of ownership; and in Enhanced areas, vehicle owners must obtain a loaded-mode test every two years and upon change of ownership. Smog Check applies to all gasoline-powered and most alternatively-fueled passenger cars and trucks. Motorcycles plus diesel and electric vehicles are exempt from the program.

There are also many different types of Smog Check stations. Most consumers are familiar with Test and Repair stations which combine Smog Check testing with repair facilities. In addition, a network of Test-Only stations offers only Smog Check tests. A State contractor operates Referee Stations which perform the same functions as Test-Only stations, as well as resolving disputes and handling special cases. 1996 legislation also authorized a BAR pilot program to create a special class of Test and Repair stations under the Gold Shield Program. This Program certifies Gold Shield Guaranteed Repair stations and Gross Polluter Certification stations. The Gold Shield Guaranteed Repair stations are BAR-certified and must guarantee repairs performed on gross-polluting vehicles. A subset of the Gold Shield Guaranteed Repair stations are designated as Gross Polluter Certification stations and are authorized to certify that selected gross-polluting vehicles have passed Smog Check.

The 1990 Clean Air Act required California to implement Enhanced I/M in the urbanized portions of six federal ozone nonattainment areas in the State. As implemented under State law, "urbanized area" encompasses urban areas with a population greater than 50,000. In many of the nonattainment areas, the urbanized portion is subject to Enhanced I/M while the remaining portion of the nonattainment area is subject to the Basic program. When California developed the Enhanced I/M program, we also improved the existing Basic I/M program. Thus, all areas of the State have seen improvements in the Smog Check program over the last several years. This chapter describes the Enhanced I/M program envisioned in the 1994 SIP for ozone, and compares it to the program being implemented in California today.

A. Program Design Envisioned in the SIP

Under the 1994 SIP for Ozone, California agreed to implement a number of "enhancements" to the I/M program in the urbanized portions of six federal ozone nonattainment areas. While all of the changes are important, the two most significant changes envisioned were requiring loaded-mode testing using a dynamometer (instead of two-speed idle testing), and directing at least 15 percent of the vehicles subject to smog inspection and expected to be the highest emitters to Test-Only stations instead of Test and Repair stations.

1. *Loaded-Mode Testing*

Under the two-speed idle test protocol, vehicles receive a functional and visual inspection of the emission control systems to identify malfunctioning or tampered (missing or modified) emission controls, as well as a tailpipe emissions test to measure HC and CO emissions. Because NOx emissions from vehicles are only significant when load is imposed on the engine (e.g., when climbing hills or accelerating), an idle test cannot be used to measure NOx emissions.

Vehicles registered in Enhanced areas of the State receive a modified visual and functional inspection, and a loaded-mode tailpipe emissions inspection. The loaded-mode test (also known as Acceleration Simulation Mode or “ASM”) uses a dynamometer to apply a load to the vehicle – allowing the measurement of NOx emissions. The ASM test differs from the U.S. EPA-preferred IM240 test, which is a transient test. Even in Enhanced areas, the loaded-mode test is applied only to gasoline vehicles weighing less than 8,501 pounds. Gasoline vehicles weighing over 8,500 pounds receive a two-speed idle test. Full-time four wheel drive vehicles that cannot safely be tested on a dynamometer also receive a two-speed idle test.

2. *Test-Only Stations*

The separation of testing from repairs is the second significant difference between the Enhanced and Basic programs. Separating testing from repair mitigates the real and perceived conflict of interest for Test and Repair stations which must simultaneously address the needs of the State (which requires accurate, unbiased testing) and the consumer (who wants to pass Smog Check).

In Enhanced areas of the State, a minimum of 15 percent of the vehicles subject to smog inspection are directed to Test-Only stations for their initial smog inspection. This amounts to approximately 750,000 vehicles per year. The 15 percent is comprised of likely high-emitting vehicles (selected through a computer profiling process) and a two percent random sample. In addition, under the 1994 SIP, all vehicles that fail a smog inspection as “gross polluters” were assumed to receive their final certification test at a Test-Only station to verify that the repairs were adequate.

3. *Electronic Transmission of Test Results*

While the above are the two most significant changes, there were a number of additional requirements envisioned in the SIP for the Enhanced I/M program. For example, the SIP assumes the State implements a system to connect all smog inspection stations to a centralized database (commonly referred to as Electronic Transmission or “ET”), which records smog check inspection and repair data. Currently, all smog inspection stations in Enhanced, Basic, and Change of Ownership areas (including Referee stations) are connected to the centralized electronic database. Inspection and repair data is captured and reviewed by BAR for program evaluation and enforcement purposes.

4. *Evaporative Emissions Testing*

Hydrocarbon emissions from vehicles have two sources – exhaust from the tailpipe and evaporative emissions from faulty gas caps and fuel system leaks. The SIP assumes that California implements programs to test for evaporative emissions, which had never been done before. The “evap” test is a gas cap pressure test that is required in all areas of the State – Change of Ownership, Basic, and Enhanced. Although the SIP envisioned a full pressure test of the evaporative emission system, due to technical issues, only the gas cap pressure test is used in California.

5. *Remote Sensing*

Another innovative feature of the program envisioned in the SIP was to implement an in-use emissions audit program (such as remote sensing) to detect high-emitting vehicles and identify low performing Smog Check stations. The intent of this element is to identify high-emitting vehicles, require those vehicles to obtain an emission inspection outside of the normal two-year test cycle (“off-cycle” testing), and require repair, if needed. In addition, those vehicles found to be “clean” could be exempted from biennial inspection.

6. *Repair Cost Limit and Economic Hardship Extension*

A significant issue under the pre-existing Basic program was the ability of vehicle owners to obtain a waiver without fully repairing the vehicle. Both Basic and Enhanced programs now require a \$450 cost minimum to obtain a repair cost waiver – except in the case of a gross-polluting vehicle, which must be repaired so that emissions are below the gross-polluting threshold, irrespective of cost, before the vehicle is eligible for a repair cost waiver. Consumers can also obtain an economic hardship extension by declaring a hardship and either spending at least \$250 on repairs or presenting a repair estimate for over \$250. The program envisioned in the SIP modeling would have also prohibited consecutive repair cost waivers for the same vehicle.

B. Current Program Design

Today’s Enhanced I/M program differs substantially from the program assumed in the 1994 SIP. Many of the changes came about as a legislative response to consumer and smog inspection station resistance to the new program. These changes were made to improve consumer convenience and program cost effectiveness. In most (albeit not all) cases, the effect of these changes is to reduce the overall emission benefits of the new program compared to what would have been achieved under the program envisioned in the 1994 SIP.

Table II–1 shows a side-by-side comparison of the evolution of the Enhanced smog inspection program from the time we developed the 1994 SIP to today. A discussion of the major changes follows.

**Table II-1
Comparison of Current Enhanced Program to 1994 SIP Assumptions**

Anticipated in the 1994 SIP	Current Program
<ul style="list-style-type: none"> • Biennial loaded-mode testing of vehicles less than 14,001 pounds gross vehicle weight; applies to 1966 and newer vehicles 	<ul style="list-style-type: none"> • 1973 and older vehicles exempt from biennial inspection requirements (in 2003, all vehicles 30 years old and older will be exempt); • Vehicles 4 years old and newer exempt from biennial inspection requirements, but subject to inspection at change of ownership; • 1974-1996 vehicles subject to biennial inspection; • Vehicles less than 8,501 pounds tested with loaded-mode.
<ul style="list-style-type: none"> • 36% of the vehicles subject to smog inspection and all vehicles identified as gross polluters directed to Test-Only stations for inspection and final certification. 	<ul style="list-style-type: none"> • A minimum of 15% of the vehicles subject to smog inspection directed to Test-Only stations for inspection and final certification (BAR given the authority to increase the directed percentage if necessary to meet emission reduction targets); • Gross polluters allowed to be re-tested and certified by either a Test-Only station or a Gross Polluter Certification Test and Repair station.
<ul style="list-style-type: none"> • One-time \$450 repair cost waiver and no waiver for vehicles identified as gross polluters. 	<ul style="list-style-type: none"> • One-time \$450 repair cost waiver and \$250 hardship extension for low-income consumers; • Vehicles identified as gross polluters are eligible for the repair cost waiver and the hardship extension.
<ul style="list-style-type: none"> • Vehicles identified as gross polluters and/or with tampered emission control systems must be annually inspected. 	<ul style="list-style-type: none"> • Repealed. No annual inspection requirements.
<ul style="list-style-type: none"> • “Off-cycle” testing program for vehicles identified as gross polluters via an on-road emissions measurement program (remote sensing). 	<ul style="list-style-type: none"> • Not implemented at this time.
<ul style="list-style-type: none"> • Modest vehicle retirement program funded by a \$39 “Skip Your First Smog” program for vehicles less than 2 years old. 	<ul style="list-style-type: none"> • Both a vehicle retirement program and a repair assistance program. Current funding available is approximately \$100 million.

1. *Vehicle Exemptions*

In 1997, the California Legislature passed and the Governor signed legislation to exempt vehicles 1973 and older from all smog inspection requirements (Enhanced, Basic and Change of Ownership). Under this legislation, beginning in 2003, vehicles 30 or more model-years old will be exempted. This change reduced the number of vehicles tested by approximately 500,000 vehicles (250,000 vehicles per year).

In addition, four-year old and newer vehicles are exempt from both Basic and Enhanced biennial inspection requirements. These vehicles must undergo a smog inspection upon change-of-ownership or initial registration in California. The current new car exemption reduced the number of vehicles tested by approximately 3.8 million vehicles (1.9 million vehicles per year).

2. *Gross Polluter Requirements*

In 1997, the Legislature also repealed the requirement to annually inspect vehicles identified as gross polluters or vehicles with tampered emission control systems. Current law also allows gross-polluting vehicles to receive a \$450 repair cost waiver reducing the overall emission benefits of the Enhanced program.

Another significant change to the originally envisioned Enhanced program is a provision to allow BAR to operate a pilot program so that vehicles identified as gross polluters can be repaired, re-tested, and certified at Gross Polluter Certification stations. Under the 1994 SIP, these vehicles were envisioned to be tested annually at a Test-Only station. While the emissions impact of this change has not been quantified or estimated, recent BAR covert audits show that Test-Only stations perform proper inspections “better” than Gross Polluter Certification stations. Therefore, this change probably reduces the overall emission benefits of the Enhanced I/M program. This change does, however, enhance consumer convenience by reducing the “ping-pong” effect when consumers repair their vehicles and then go to a Test-Only station only to fail the test and have to return to their mechanic for additional repairs.

3. *Consumer Assistance Program*

On a more positive note, the Legislature also established a repair assistance program for low-income motorists and for consumers with vehicles that have been directed to Test-Only stations. A vehicle retirement program has also been established which pays consumers with failing vehicles a specified amount to voluntarily retire rather than repair their vehicle. This program uses State funds to purchase and retire vehicles, or to supplement the repair of failed vehicles. This change increases emission benefits, somewhat offsetting the impact of both the Economic Hardship Extension which allows low-income motorists to obtain a waiver after spending \$250 (instead of \$450), and the repair cost waiver for gross polluters.

4. *Test-Only Stations*

Although the original SIP analysis assumed that 36 percent of the vehicles would be directed to Test-Only stations, 20 percent of vehicles are being directed to Test-Only stations as of April 1, 2000. Because Test-Only stations have been shown to perform more complete inspections, emission benefits from the current Enhanced program are likely lower than the emission benefits assumed in the SIP.

5. *Cut Points*

Cut points are the pass or fail standards Smog Check stations use to determine whether a vehicle passes Smog Check. Cut points vary by both type of vehicle and model year. Current cut points are at relatively lax levels when compared to the cut points assumed in the 1994 SIP. Anecdotally, today's overall vehicle failure rate is approximately 14 percent; whereas, pilot studies conducted by BAR indicated that the overall failure rate would approach 30 percent at the final cut points assumed in the SIP.

6. *Enforcement and Certification*

The statewide smog inspection network consists of over 400 licensed, privately-operated Test-Only stations and over 7,000 licensed Test and Repair stations. BAR has implemented an aggressive Smog Check Enforcement Program, which includes regular station audits, undercover audits, complaint mediation, and formal investigations. With the implementation of the Enhanced and improved Basic I/M programs, BAR initiated more aggressive enforcement efforts intended to devote more resources to ensuring that Smog Check stations operate within the law.

7. *Remote Sensing*

Remote sensing is based on a radar-like device that uses an infrared or ultraviolet light beam to measure vehicle emissions. Because the equipment can measure emissions from vehicles as they are driven, remote sensing technology can be used to assess the emissions of cars traveling on normal roadways without inconveniencing vehicle owners. Programs that depend on remote sensing, such as the off-cycle testing and repair programs have not yet been fully implemented.